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(54) R-Fe-B base permanent magnet materials

(57) A R-Fe-B base permanent magnet material is composed of a R-Fe-B magnet alloy which contains 87.5-97.5 vol% of a  $\text{Fe}_{14}\text{R}_2\text{B}_1$  primary phase and 0.1-3 vol% of a rare earth oxide or a rare earth and transition metal oxide. The alloy contains as a major component in its metal structure a compound selected from among zirconium-boron compounds, niobium-boron com-

pounds and hafnium-boron compounds. The compound has an average grain size of at most 5  $\mu\text{m}$  and is uniformly distributed within the alloy such that the maximum interval between neighboring grains of the compound is at most 50  $\mu\text{m}$ . Rare-earth permanent magnet materials of this composition and structure have excellent magnetic properties.

FIG.2

